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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/801,653 | 03/17/2004 | Peter Zentgraf | P25021 | 1681 |

7055 7590 12/19/2006

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| EXAMINER | |
|---|---|
| PIPALA, EDWARD J | |
| ART UNIT | PAPER NUMBER |
| 3663 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | NOTIFICATION DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 12/19/2006 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 12/19/2006.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/801,653 | ZENTGRAF, PETER | |
| | Examiner | Art Unit | |
| | Edward Pipala | 3663 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *05 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) *5,6 and 12-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 7-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. This Office action is in response to Applicant's arguments and remarks filed 10/5/06.

Claims 1-14 are presently pending, claims 5, 6 and 12-14 have been withdrawn from consideration as being directed to a non-elected invention.

The previous objection to the specification (wrt new matter) is hereby withdrawn.

The previous rejections under 35 U.S.C. 112, first and second paragraphs, has been withdrawn in view of Applicant's arguments and remarks (and withdrawal of the new matter objection).

### *Claim Rejections - 35 USC § 101*

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-4 and 7-11 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter in that the claimed "method of computer assisted determination of optimum-fuel control of nozzles according to a control instruction $b=Ax$" is still nothing more than a series of mathematical matrix operations without finally getting around to ***operating*** the nozzles ***using*** the recited method of optimum-fuel control method, which would then be seen as having a useful and tangible concrete result.

In preamble of each of independent claims 1 and 7 Applicant recites a method for the "computer assisted determination" (claim 1) and "[a] computer control method" (claim 7), to

obtain an optimum fuel control of nozzles and then goes on to lay out the matrix representations for the terms of the control instruction, and a series of data manipulation steps of computer generation of starting constraints, data processing a representation of a geometric description of the starting constraints, searching limiting points sets of the geometric description with a computer-assisted geometric search procedure, and then applying the matrix transformation of the minimization criterion to the points of the limiting point set (claim 1 being used as a representative example).

Dependent claims 2-4 further involve additional matrix/mathematical manipulations and calculation, where claim 2 recites finding a homogenous solution to the control instruction for the starting constraints, claim 3 recites more matrix transformation and determining of limiting point sets, where claim 4 adds repeatedly projecting allowable multi-dimensional value regions of the dimension p and subsequently searching with a computer-assisted search procedure for a determination of limiting point sets as a cut set of limiting intervals.

The scope of independent claim 7 further appears to be broader than that of independent claim 1, since some of that subject matter (as found in claim 1), is now in the form of dependent claim 8 (defining the control instruction $b=\boldsymbol{A}x$, along with the nozzle matrix and nozzle control vector). Dependent claim 9 (depending from claim 8) further recites determining a homogenous solution for the control instruction and introduces a new claim limitation in the form of scalar products of a vector representation of points of the limiting point set and calculating an optimum-fuel solution with the aid of vector $\boldsymbol{r}$ whose scalar product is minimal with vector $\boldsymbol{v}_d$. Claim 10 is similar to previous claim 3, and claim 11 is similar to previous claim 4.

The reason that these claims are not statutory subject mater under 35 U.S.C. 101 is that even though Applicant recites this method (or methods) within an environment of optimum-fuel control of nozzles, Applicant does not seem to implement the "results" of the control method in any manner (i.e., applying the control solution to the recited nozzle matrix to effect the desired force/torque results of a vehicle to which they are appended), so as to provide a recognizable useful concrete and tangible end result.

***Response to Arguments***

3. Applicant's arguments filed 10/5/06 with respect to the present rejection of claims 1-4 and 7-11, as being directed to non-statutory subject matter in view of 35 U.S.C. 101, have been fully considered but they are not persuasive.

Applicant's arguments with respect to the above rejection focus, as they correctly should, on whether the claimed method produces a useful, tangible and concrete result, and further suggest that the Examiner has not provided a *prima facia* case of unpatentability.

The fact of the matter is that as Applicant has indicated by citing the OG Guidelines, and as both Applicant and the Examiner agree that the basis for the decision of patentability or unpatentability of this type of subject matter (essentially claiming mathematical algorithms), is to determine whether the claimed method produces a useful, tangible **and** concrete result. At the Examiner has stated in the previous rejection, and presently above, Applicant does not meet the last criterion of having a "concrete" result because the method claims do not actually recite the use of the end result of the mathematical processing to perform the "optimum-fuel control of nozzles", as recited in the preamble of independent claims 1 and 7. This is the last

of the three criteria required by the USPTO guidelines on this topic. On the one hand Applicant simply argues that the Examiner has mis-applied the guidelines with respect to the "useful, tangible and concrete result" requirement(s), and subsequently Applicant further argues that a concrete result is achieved even though Applicant admits that the results of the computer-assisted processing is *not* used (to provide the concrete result) of controlling nozzles in compliance with the recited method.

***Conclusion***

**4. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edward Pipala whose telephone number is 571-272-1360. The examiner can normally be reached on M-F 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ejp

JACK KEITH
SUPERVISORY PATENT EXAMINER